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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/954,699	09/14/2001	Jeremy M. Stein	000391	8615

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Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
San Diego, CA 92121-1714

EXAMINER

TRINH, SONNY

ART UNIT	PAPER NUMBER
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2687

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/954,699	Applicant(s) STEIN, JEREMY M.	
	Examiner Sonny TRINH	Art Unit 2687	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-65 is/are pending in the application.
4a) Of the above claim(s) 18-59, 64 and 65 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 60-63 is/are allowed.
- 6) ☒ Claim(s) 1-3, 8-14, 16 and 17 is/are rejected.
- 7) ☐ Claim(s) 4-7 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

General notes:

1. On page 1 of the response to the Restriction/Selection filed by Applicant on 08/10/2004, it appears that the serial number 09/519,734 is filed by mistake. Patent number 6,721,368 was already granted to application number 09/519,734. However, the content of the ELECTION filed was correct in the grouping of the claims and the numbering of the claims. Therefore, it is assumed that serial number filed on this paper is 09/954,699, the Applicant is Jeremy Stein and the correct title is: "Method and apparatus for detecting excess delay in a communication signal."

Election/Restrictions

2. Applicant's election without traverse of Group I (claims 1-17, 60-63) in the reply filed on 08/10/04 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. **Claims 1-3, 11-14, 16-17** are rejected under 35 U.S.C. 102(a) as being anticipated by Fattouche ("Fatouche"; U.S. Patent Number 6,204,812).

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Regarding claim 1, Fattouche discloses a method of determining location of a mobile unit (abstract), the method comprising:

receiving signals from at least two base stations (figure 2, see description);

determining a time difference of arrival between the received signals (column 8 line 45 to column 9 line 10, column 15, starting from line 45, columns 24-26);

estimating a lower bound of excess delay in accordance with the time of arrival of the signals and known distances between the base stations and estimating a location of the mobile unit in accordance with the estimated lower bound of excess delay and the time difference of arrival between the received signals (starting from column 13, see "Cramer-Rao lower bound" referenced by Fattouche throughout the reference).

Regarding **claim 2**, Fattouche further teaches that the received signals are CDMA pilot signals (column 5 lines 17-45, figure 10, column 20 lines 25-44).

Regarding **claim 3**, Fattouche further teaches that the received signals are GSM signals (column 20 lines 25-44).

Regarding **claim 11**, Fattouche further teaches that the signals received from the base stations are transmitted from the base stations at the same time (column 39 lines 15-29).

Regarding **claim 12**, Fattouche further teaches that the signals received from the base stations are transmitted synchronized in time to each other (column 39 lines 15-29).

Regarding **claim 13**, since Fattouche teaches the methods and apparatus to position a mobile receiver using downlink signals, the received signals are communication signals (inherent).

Regarding **claim 14**, Fattouche further teaches that the received signals are cellular communication signals (column 6 lines 18-24, column 23 line 52 to column 24 line 8).

Regarding **claims 16-17**, Fattouche further teaches the estimating location of the mobile unit includes another position location system (column 5, GPS system).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 8-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fattouche ("Fattouche"; U.S. Patent Number 6,204,812) in view of Morley, G.D ("Morley"; Improved location estimation with pulse-ranging in presence of shadowing and multipath excess-delay effects; Electronics Letters , Volume: 31 , Issue: 18 , 31 Aug. 1995, Pages:1609 – 1610).

Regarding **claims 8-10**, Fattouche discloses the invention but does not explicitly disclose that the lower bound of excess delay for the received signals is used to

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determine an accuracy of the location estimate of the mobile unit, nor the excess delay introduced into the signals is due to multi-path, nor the signals are received at the mobile unit from a plurality of base stations and the lower bound on the excess delay is estimated for a plurality of signal time of arrival determinations.

In an analogous art, Morley teaches an improved location estimation with pulse ranging in presence of shadowing and multi-path excess delay effects. Morley further teaches that the excess delay for the received signals is used to determine an accuracy of the location estimate of the mobile unit, and the excess delay introduced into the signals is due to multi-path (pages 1609-1610).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to apply the teaching of Morley to the system of Fattouche in order to improved the location estimation of the mobile receiver, by using the least square method, it contributes to location finding applications without needing GPS receivers in mobiles or phased arrays at the base stations to combat multi-paths.

Allowable Subject Matter

5. **Claims 4-7, 15** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding **claim 4**, the prior art provided numerous examples of determining the location of a mobile telephone using TDOA, but failed to disclose or fairly suggest the specific combination of structural and functional limitations set forth in claim 4,

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specifically, wherein the steps of adjusting the estimated location of the mobile unit using the lower bound of excess delay.

Regarding **claim 15**, the prior art provided numerous examples of determining the location of a mobile telephone using TDOA, but failed to disclose or fairly suggest the specific combination of structural and functional limitations set forth in claim 15, specifically, wherein the estimating the lower bound of excess delay is done with less than all of the signals received from the base stations.

Claims 60-63 are allowed.

Regarding **claim 60**, Fattouche fails to disclose or fairly suggest the method of determining location of a mobile unit, the method comprising: receiving signals from at least two base stations and determining the time of arrival at the mobile unit for the respective signals; determining the time difference of arrival between the received signals from the respective base stations; estimating a lower bound of excess delay in accordance with the time of arrival of the signals from their respective base stations and known distances between the base stations; and transmitting the time difference of arrival and lower bound of excess delay to a different location and estimating location of the mobile unit in accordance with the estimated lower bound of excess delay and the time difference of arrival between the received signals at the different location.

Claim 61 is allowed by virtue of its dependency on claim 60.

Regarding **claim 62**, Fattouche fails to disclose or fairly suggest the method of determining location of a mobile unit, the method comprising: receiving signals from at least two base stations and determining the time of arrival at the mobile unit for the

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respective signals; transmitting the times of arrival of the signals to a different location;
determining the time difference of arrival between the received signals from the
respective base stations at the different location; estimating a lower bound of excess
delay in accordance with the time of arrival of each signal from its respective base
station and a known distance between the base stations at the different location; and
estimating location of the mobile unit in accordance with the estimated lower bound of
excess delay and the time difference of arrival between the received signals at the
different location.

Claim 63 is allowed by virtue of its dependency on claim 60.

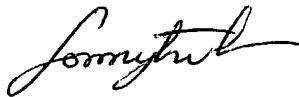
CONCLUSION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sonny TRINH whose telephone number is 703-305-1961. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester KINCAID can be reached on 703-306-3016. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SONNY TRINH
PRIMARY EXAMINER

11/2/04